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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,638	08/29/2003	Douglas M. Baney	10030170-1	1820

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Kathy Manke
Avago Technologies Limited
4380 Ziegler Road
Fort Collins, CO 80525

EXAMINER	
PAJOOHI, TARA S	

ART UNIT	PAPER NUMBER
2886	

NOTIFICATION DATE	DELIVERY MODE
01/23/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

avagoip@system.foundationip.com
kathy.manke@avagotech.com
scott.weitzel@avagotech.com

Office Action Summary	Application No.	Applicant(s)	
	10/652,638	BANEY ET AL.	
	Examiner	Art Unit	
	Tara S. Pajoohi	2886	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/07/08*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5,7,10-16,18 and 23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,7,10-16,18 and 23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/7/2008 has been entered.

Response to Amendment

2. Acknowledgement is made to amendment filed on 10/14/2008.

3. Currently, claims 1, 3-5, 7, 10-16, 18 and 23 are still pending.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1 and 3-5** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hughes et al. (U.S. Patent No. 4,184,767)** in view of **Mocker et al. (U.S. Patent No. 5,128,794).**

6. Considering **claims 1, 3 and 5,** Hughes discloses (abstract and col. 2-5) and shows in figure 1, a method for determining the position of an object, comprising:

a. providing one or more EM beams (narrowband beams tuned or swept across a range of frequencies) (i.e., a continuous tunable laser source (10) tuning across a predetermined frequency bandwidth, col. 2, lines 6-10);

b. dispersing said one or more EM beams, restively, into a scanning space by frequency (i.e., frequency is scanned out of the laser source is directed to a dispersive element, col. 2, lines 12-16);

c. retro-reflecting at least a portion of the respective dispersed beams off of an object (30) (i.e., reflecting energy off of object (30) will be collected by collecting optics (50), col. 2, lines 20-31);

d. determining, in response to frequencies associated with said retro-reflected beams, respective angular positions of the object (i.e., the frequency of the detected signal is determined by the laser detection system (60) and the change in elevation angle of the object is determined automatically, col. 2, lines 28-31);

e. triangulating spatial coordinates of said object using two or more (three or more) of said respective angular positions (20', 20", 20"',…20 n^{th}); and

f. rotating polarization state of the retro-reflected beams by polarizing beam splitters (302).

Hughes fails to specifically disclose providing at least two electromagnetic beams, being provided from two different EM sources. Hughes also fails to specifically disclose rotating the polarization of the at least two EM beams and the retro-reflected beam by polarizing beam splitters.

Mocker discloses (col. 2-3) providing at least two beams provided from at least two different sources (24 and 25), retro-reflecting (14) at least a portion of the beam off of an object (12) positioned within the scanning space (i.e., from scan mirror, 38), rotating the polarization state of the at least two beams (34 and 35), rotating polarization state of the retro-reflected beams (34 and 35) such that they are treated differently by polarizing beam splitters (30 and 31) located in respective paths (see figure 2b).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the position of an object with two different EM sources, and rotating the polarization state of the at least two EM beams and retro-reflected beams as taught by Mocker in the method of Hughes, since Mocker teaches that it provides high position accuracy.

7. Considering **claim 4,** Hughes discloses the one or more EM beams are broadband beams (i.e., light with a broad spectral band, col. 4, lines 66-67).

8. **Claims 7 and 10-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hughes et al. (U.S. Patent # 4,184,767** in view of **Mocker et al. (U.S. Patent No. 5,128,794)** and further in view of **Washington (U.S. Patent # 6,031,613).**

9. Regarding **claim 7,** Hughes discloses (abstract and col. 2-4) and shows in figure 1, a position determination system comprising:

a. one or more EM sources that provide EM beams (i.e., a continuous tunable laser source (10) tuning across a predetermined frequency bandwidth, col. 2, lines 6-10);

b. one or more beam dispersion devices (prism) (col. 3, lines 22-25) that respectively disperse the one ore more EM beams into a scanning space by frequency, therein the system is configured to be responsive to the retro-reflective object positioned with the scanning space such that the retro-reflective object retro-reflects at least a portion of the respective dispersed beams (i.e., frequency is scanned out of the laser source is directed to a dispersive element, which changes the frequency scan into a spatial scan, col. 2, lines 12-16);

c. one or more receptors that receive the respective retro-reflected beams and provide signals for determining the respective angular positions of the retro-reflective object (i.e., the frequency of the detected signal is determined by the laser detection system (60) and the change in elevation angle of the object is determined automatically, col. 2, lines 28-31);

d. triangulating spatial coordinates of said object using two or more (three or more) of said respective angular positions (20', 20", 20"',…20 n^{th}); and

e. one ore more partially reflective surfaces (beam splitter 302) to direct the EM beams to the beam dispersion device and that pass the retro-reflected beams to the one or more receptors.

Hughes fails to disclose a partially reflective surface that directs the EM beams from the EM source to direct the EM beam from the source to the dispersion device and that pass the retro-reflected beam to the receptor.

Mocker discloses (col. 2-3) providing at least two beams provided from at least two different sources (24 and 25), retro-reflecting (14) at least a portion of the beam off of an object (12) positioned within the scanning space (i.e., from scan mirror, 38) (applicant's dispersion device) to the receptor (42 and 43).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the position of an object with two different EM sources, and rotating the polarization state of the at least two EM beams and retro-reflected beams as taught by Mocker in the method of Hughes, since Mocker teaches that it provides for high position accuracy.

Still lacking the limitation that a processor is in signal communication with the one or more receptors such that the angular position of the object is determined based on their frequencies.

In the same field of endeavor, Washington discloses (col. 5, lines 55-65) a processor (150) in communication with a receptor (112) that determines in response to frequencies associated with the respective retro-reflective (102) beams, the angular position of the retro-reflective object.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a processor to analyze the signal received at the receptor to determine the

angular position of the retro-reflective object as taught by Washington in the modified system of Hughes, since Washington teaches that it would advantageously be TTL compliant (col. 5, lines 60-63).

17. Considering **claim 10,** Hughes discloses (col. 4, lines 30-55) shows in figure 4, adjusting the orientation of the polarization of the beam to elliptical polarization.

18. Considering **claim 11,** Hughes discloses (abstract and col. 2-4) triangulating spatial coordinates of said object using two or more (three or more) of said respective angular positions (20', 20", 20"',…20 n^{th}).

19. Considering **claim 12,** Hughes discloses (col. 2, lines 6-10) the one or more EM beams include narrowband beams tuned or swept across a range of frequencies (i.e., a continuous tunable laser source (10) tuning across a predetermined frequency bandwidth).

20. Regarding **claims 13 and 14,** the modified system of Hughes discloses (col. 2 of Hughes) photo-detectors (60) associated with the one or more receptors configured to detect receipt of the retro-reflected beams but fails to specifically disclose they a processor is configured to use /determine the frequencies which are associated with the retro-reflected beams to determine the angular position.

In the same field of endeavor, Washington discloses (col. 5, lines 55-65) a processor (150) in communication with a receptor (112) to determine the angular position of the object (102) based on the frequency of the output signal.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a processor to analyze the signal received at the receptor to determine the angular position of the retro-reflective object as taught by Washington in the modified system of

Hughes, since Washington teaches that it would advantageously be TTL compliant (col. 5, lines 60-63).

21. Considering **claim 15,** Hughes discloses the use of broadband sources (col. 4, lines 65-67) but fails to specifically disclose the processor is in signal communication with the one or more receptors such that the angular position of the object is determined based on their frequencies.

In the same field of endeavor, Washington discloses (col. 5, lines 55-65) a processor (150) in communication with a receptor (112) that determines in response to frequencies associated with the respective retro-reflective (102) beams, the angular position of the retro-reflective object.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a processor to analyze the signal received at the receptor to determine the angular position of the retro-reflective object as taught by Washington in the modified system of Hughes, since Washington teaches that it would advantageously be TTL compliant (col. 5, lines 60-63).

Still lacking the limitation of the wavemeter.

However, it would have been an obvious matter of design choice to use a wavemeter instead of a photodetector to detect the retro-reflected beams when using electromagnetic beams since a wavemeter measures the distance between waves of EM waves.

Considering **claim 16,** Hughes discloses (col. 3, lines 21-25) the dispersion device is a prism.

Hughes fails to specifically disclose providing at least two electromagnetic beams, being provided from two different EM sources.

In the same field of endeavor, an apparatus and method for determining the position and orientation of an object in space, Mocker discloses (col. 2-3) providing at least two beams provided from at least two different sources (24 and 25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the position of an object with two different EM sources to provide at least two EM beams as taught by Schultz in the method of Hughes, since Mocker teaches that it provides for high position accuracy.

16. As per **claim 18,** Hughes discloses (col. 5-6) the use of polarized beamsplitters (401, 402 and 403), one ore more polarization state rotators (404, 405, 406), a retro-reflective object and one ore more receptors (60) but fails to specifically disclose the polarization rotators are positioned between the retro-reflected object and the polarization beam-splitter.

Mocker discloses (col. 2-3) providing at least two beams provided from at least two different sources (24 and 25), retro-reflecting (14) at least a portion of the beam off of an object (12) positioned within the scanning space (i.e., from scan mirror, 38), rotating the polarization state of the at least two beams (34 and 35), rotating polarization state of the retro-reflected beams (34 and 35) such that they are treated differently by polarizing beam splitters (30 and 31) located in respective paths (see figure 2b).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the position of an object with two different EM sources, and rotating the polarization state of the at least two EM beams and retro-reflected beams as taught by Mocker in the method of Hughes, since Mocker teaches that it provides high position accuracy.

17. Considering **claim 23,** Hughes discloses (abstract and col. 2-4) and shows in figure 1, a position determination system comprising:

one or more EM sources that provide EM beams (i.e., a continuous tunable laser source (10) tuning across a predetermined frequency bandwidth, col. 2, lines 6-10);

a. one or more beam dispersion devices (prism) (col. 3, lines 22-25) that respectively disperse the one ore more EM beams into a scanning space by frequency, therein the system is configured to be responsive to the retro-reflective object positioned with the scanning space such that the retro-reflective object retro-reflects at least a portion of the respective dispersed beams (i.e., frequency is scanned out of the laser source is directed to a dispersive element, which changes the frequency scan into a spatial scan, col. 2, lines 12-16);

b. one or more receptors that receive the respective retro-reflected beams and provide signals for determining the respective angular positions of the retro-reflective object (i.e., the frequency of the detected signal is determined by the laser detection system (60) and the change in elevation angle of the object is determined automatically, col. 2, lines 28-31);

c. the processor triangulates coordinates of said object using two or more (three or more) of said respective angular positions (20', 20", 20"',…20 n^{th}) (abstract and col. 2-4); and

d. adjusting the orientation of the polarization of the beam to elliptical polarization (col. 4, lines 30-55).

Hughes fails to specifically disclose at least two EM sources that provide two beams, at least two beam dispersion devices, at least two receptors, at least two partially reflective surfaces.

Mocker discloses (col. 2-3) providing at least two beams provided from at least two different sources (24 and 25), retro-reflecting (14) at least a portion of the beam off of an object (12) positioned within the scanning space (i.e., from scan mirror, 38) (applicant's dispersion device) to the receptor (42 and 43).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the position of an object with two different EM sources, and rotating the polarization state of the at least two EM beams and retro-reflected beams as taught by Mocker in the

method of Hughes, since Mocker teaches that it provides for high position accuracy. It would have been further obvious to having ordinary skill in the art at the time the invention was made to have two light sources, two EM beams, two receptors, two partially reflective surfaces, since it has been held that a mere duplication of the essential working parts of a device involves only routine skill in the art. St. Regis Paper Co. v Bemis Co., 193 USPQ 8.

Hughes also fails to disclose a processor is in signal communication with the one or more receptors such that the angular position of the object is determined based on their frequencies.

In the same field of endeavor, Washington discloses (col. 5, lines 55-65) a processor (150) in communication with a receptor (112) that determines in response to frequencies associated with the respective retro-reflective (102) beams, the angular position of the retro-reflective object.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a processor to analyze the signal received at the receptor to determine the angular position of the retro-reflective object as taught by Washington in the system of Hughes, since Washington teaches that it would advantageously be TTL compliant (col. 5, lines 60-63).

Response to Arguments

18. Applicant's arguments with respect to claims 1, 3-5, 7, 10-16, 18 and 23 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tara S. Pajoohi whose telephone number is (571)272-9785. The examiner can normally be reached on Monday - Thursday 9:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur R. Chowdhury can be reached on 571-272-2287. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tara S. Pajoohi
Patent Examiner

TSP
/TARIFUR R CHOWDHURY/
Supervisory Patent Examiner, Art Unit 2886